## IN THE CLAIMS:

All of the pending claims 1, 5-19, 23-34, 38 and 39 are set forth below. The status of each claim is indicated with one of (original), (currently amended), (previously presented) or (cancelled). Please CANCEL claims 3, 4, 21 and 22 without prejudice or disclaimer, and AMEND claims 1, 5, 6, 8, 19, 23-26, 30, 31, 38 and 39 in accordance with the following:

1.      (currently amended) A transmission characteristic equalizing system, comprising:

at least one optical tunable filter having a variable transmission factor versus wavelength characteristic and placed along an optical transmission path between a transmitting station and a receiving station in a wavelength division multiplexing optical communication system;

a transmission characteristic measurement unit measuring transmission characteristics of optical signals of different wavelengths transmitted over the optical transmission path; and

a transmission characteristic control unit, based on measurements made by the transmission characteristic measurement unit, controlling amounts of pre-emphasis in the transmitting station and the transmission factor versus wavelength characteristic of the optical tunable filter to thereby equalize the transmission characteristics for the optical signals,

wherein the transmission characteristic control unit calculates an optimum allocation between a controlled variable of the amounts of pre-emphasis in the transmitting station and a controlled amount of the transmission factor versus wavelength characteristic of the optical tunable filter and controls the amounts of pre-emphasis and the transmission factor versus wavelength characteristic according to the optimum allocation to thereby equalize and optimize the transmission characteristics, and

wherein the transmission characteristic measurement unit measures first and second transmission characteristic values having a correlation with each other as the transmission characteristics, and the transmission characteristic control unit first controls only the transmission factor versus wavelength characteristic of the optical tunable filter to equalize the first transmission characteristic values and then temporarily equalize the second transmission characteristic values with reference to the equalized first transmission characteristic values, then calculates the optimum allocation with reference to the transmission factor versus wavelength characteristic of the optical tunable filter at a time of temporary equalization of the second transmission characteristic values, and controls the transmission factor versus wavelength characteristic of the optical tunable filter and the amounts of pre-emphasis in the

transmitting station according to the optimum allocation to thereby equalize the second transmission characteristic values.

2-4.    (cancelled)

5.    (currently amended)  The system according to claim 4<u>1</u>, wherein the process of controlling only the transmission factor versus wavelength characteristic of the optical tunable filter to temporarily equalize the second transmission characteristic values is performed by reducing a transmission factor of the optical tunable filter for each wavelength to decrease the first transmission characteristic values and thereby lower the second transmission characteristic values to a given target value, restoring the transmission factor of the optical tunable filter to an original value thereof to restore the first transmission characteristic values to initial values thereof, determining widths of variations of the first transmission characteristic values at that time, determining an average of the widths of variations of the first transmission characteristic values over all wavelengths, and adjusting the transmission factor of the optical tunable filter for each wavelength to vary each of the first transmission characteristic values by a difference between the average and a corresponding width of variation.

6.    (currently amended)  The system according to claim 4<u>1</u>, wherein the process of calculating the optimum allocation is performed, with the transmission factors of the optical tunable filter to which reference is made assumed as 100%, by controlling the amounts of pre-emphasis in the transmitting station to equalize the second transmission characteristic values each time the transmission factors of the optical tunable filter are reduced by a percentage, calculating the average of the equalized second transmission characteristic values over all wavelengths each time the transmission factors of the optical tunable filter are reduced by the percentage, and using the percentage of a reduction in the transmission factors when the average is a maximum as the optimum allocation.

7.    (previously presented)  The system according to claim 6, wherein the process of controlling the amounts of pre-emphasis in the transmitting station to equalize the second transmission characteristic values is performed by controlling the amounts of pre-emphasis to equalize the first transmission characteristic values, adjusting the amounts of pre-emphasis for each wavelength to decrease the first transmission characteristic values and thereby

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temporarily lower the second transmission characteristic values to a given target value, restoring the amounts of pre-emphasis to original values thereof to restore the first transmission characteristic values to initial values thereof, determining widths of variations of the first transmission characteristic values at that time, determining an average of the widths of variations of the first transmission characteristic values for all wavelengths, and adjusting the amount of pre-emphasis for each wavelength to vary each of the first transmission characteristic values by a difference between the average and a corresponding width of variation.

8.      (currently amended)  The system according to claim 4~~1~~, wherein the transmission characteristic control unit calculates the optimum allocation prior to a start of an operation of the communication system and controls the amounts of pre-emphasis and the transmission factor versus wavelength characteristic according to the optimum allocation during the operation of the communication system to thereby equalize and optimize the transmission characteristics.

9.      (previously presented)  The system according to claim 8, wherein the process of controlling the amounts of pre-emphasis and the transmission factor versus wavelength characteristic according to the optimum allocation during the operation of the communication system is performed by adjusting the amount of pre-emphasis or a transmission factor for each wavelength to decrease the first transmission characteristic values and thereby temporarily lower the second transmission characteristic values to a given target value, restoring the amount of pre-emphasis or the transmission factor to original values thereof to restore the first transmission characteristic values to initial values thereof, determining widths of variations of the first transmission characteristic values at that time, determining an average of the widths of variations of the first transmission characteristic values over all wavelengths, adjusting the transmission factor for each wavelength to vary the first transmission characteristic values by an amount corresponding to the optimum allocation, and adjusting the amount of pre-emphasis for each wavelength to further vary the first transmission characteristic values by an amount corresponding to the optimum allocation.

10.      (previously presented)  The system according to claim 9, wherein, assuming a ratio representing the optimum allocation between a controlled variable of the transmission

factor versus wavelength characteristic and the controlled variable of the amounts of pre-emphasis to be X to 1 - X, a variation in the first transmission characteristic values by control of the wavelength characteristic according to the optimum allocation is a product of a difference and X, and the variation in the first transmission characteristic values by control of the amounts of pre-emphasis according to the optimum allocation is a product of the difference and 1 - X.

11.    (previously presented)  The system according to claim 9, wherein the given target value is a minimum value of the second transmission characteristic values specified by the communication system.

12.    (original)  The system according to claim 11, wherein the first transmission characteristic values are optical signal to noise ratios (OSNR), and the second transmission characteristic values are Q factors.

13.    (original)  The system according to claim 11, wherein the first transmission characteristic values are optical signal to noise ratios (OSNR), and the second transmission characteristic values are bit error rates (BER).

14.    (original)  The system according to claim 1, wherein the transmission characteristic measurement unit is provided in the receiving station.

15.    (original)  The system according to claim 1, wherein the transmission characteristic control unit is provided in the receiving station and the amounts of pre-emphasis in the transmitting station and the transmission factor versus wavelength characteristic of the optical tunable filter are controlled by the receiving station.

16.    (original)  The system according to claim 1, wherein the transmission characteristic control unit is provided in the transmitting station and the amounts of pre-emphasis in the transmitting station and the transmission factor versus wavelength characteristic of the optical tunable filter are controlled by the transmitting station.

17.    (original)  The system according to claim 1, wherein the amounts of pre-emphasis in the transmitting station are controlled via one of an overhead signal, a control

signal superimposed on a main signal amplitude, and a dedicated control signal.

18.     (original)  The system according to claim 1, wherein the transmission factor versus wavelength characteristic of the optical tunable filter is controlled via one of an overhead signal, a control signal superimposed on a main signal amplitude, and a dedicated control signal.

19.     (currently amended)  A method of equalizing transmission characteristics for optical signals, comprising:

placing at least one optical tunable filter having a variable transmission factor versus wavelength characteristic along an optical transmission path between a transmitting station and a receiving station in a wavelength division multiplexing optical communication system;

measuring transmission characteristics of optical signals of different wavelengths transmitted over the optical transmission path; and

controlling, based on measurements of the transmission characteristics, amounts of pre-emphasis in the transmitting station and the transmission factor versus wavelength characteristic of the optical tunable filter to thereby equalize the transmission characteristics for the optical signals, in the controlling based on the measurements of the transmission characteristics operation, calculating an optimum allocation between a controlled variable of the amounts of pre-emphasis in the transmitting station and a controlled amount of the transmission factor versus wavelength characteristic of the optical tunable filter and controlling the amounts of pre-emphasis and the transmission factor versus wavelength characteristic according to the optimum allocation to thereby equalize and optimize the transmission characteristics,

wherein, in the measuring of transmission characteristics of optical signals operation, first and second transmission characteristic values having a correlation with each other are measured as the transmission characteristics, and, in the controlling based on the measurements of the transmission characteristics operation, only the transmission factor versus wavelength characteristic of the optical tunable filter is controlled to equalize the first transmission characteristic values and then temporarily equalize the second transmission characteristic values with reference to the equalized first transmission characteristic values, then the optimum allocation is calculated with reference to the transmission factor versus wavelength characteristic of the optical tunable filter at a time of temporary equalization of the

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second transmission characteristic values, and the transmission factor versus wavelength characteristic of the optical tunable filter and the amounts of pre-emphasis in the transmitting station are controlled according to the optimum allocation to thereby equalize the second transmission characteristic values.

20-22. (cancelled)

23.     (currently amended)  The method according to claim 2219, wherein, the process in the controlling based on the measurements of the transmission characteristics operation of the controlling only the transmission factor versus wavelength characteristic of the optical tunable filter to temporarily equalize the second transmission characteristic values is performed by reducing a transmission factor of the optical tunable filter for each wavelength to decrease the first transmission characteristic values and thereby lower the second transmission characteristic values to a given target value, restoring the transmission factor of the optical tunable filter to an original value thereof  to restore the first transmission characteristic values to initial values thereof, determining widths of variations of the first transmission characteristic values at that time, determining an average of the widths of variations of the first transmission characteristic values over all wavelengths, and adjusting the transmission factor of the optical tunable filter for each wavelength to vary each of the first transmission characteristic values by a difference between the average and a corresponding width of variation.

24.     (currently amended)  The method according to claim 2219, wherein the process in the controlling based on the measurements of the transmission characteristics operation of calculating the optimum allocation is performed, with the transmission factors of the optical tunable filter to which reference is made assumed as 100%, by controlling the amounts of pre-emphasis in the transmitting station to equalize the second transmission characteristic values each time the transmission factors of the optical tunable filter are reduced by a percentage, calculating the average of the equalized second transmission characteristic values over all wavelengths each time the transmission factors of the optical tunable filter are reduced by the percentage, and using the percentage of a reduction in the transmission factors when the average is a maximum as the optimum allocation.

25.     (currently amended)  The method according to claim 2219, wherein the process

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in the controlling based on the measurements of the transmission characteristics operation of controlling the amounts of pre-emphasis in the transmitting station to equalize the second transmission characteristic values is performed by controlling the amounts of pre-emphasis to equalize the first transmission characteristic values, adjusting the amounts of pre-emphasis for each wavelengths to decrease the first transmission characteristic values and thereby temporarily lower the second transmission characteristic values to a given target value, restoring the amounts of pre-emphasis to original values thereof to restore the first transmission characteristic values to initial values thereof, determining widths of variations of the first transmission characteristic values at that time, determining an average of the widths of variations of the first transmission characteristic values for all wavelengths, and adjusting the amount of pre-emphasis for each wavelength to vary each of the first transmission characteristic values by a difference between the average and a corresponding width of variation.

26.     (currently amended)  The method according to claim ~~22~~19, wherein, in the controlling based on the measurements of the transmission characteristics operation, the optimum allocation is calculated prior to a start of an operation of the communication system and the amounts of pre-emphasis and the transmission factor versus wavelength characteristic are controlled according to the optimum allocation during the operation of the communication system to thereby equalize and optimize the transmission characteristics.

27.     (previously presented)  The method according to claim 26, wherein the process in the controlling based on the measurements of the transmission characteristics operation of controlling the amounts of pre-emphasis and the transmission factor versus wavelength characteristic according to the optimum allocation during the operation of the communication system is performed by adjusting the amount of pre-emphasis or a transmission factor for each wavelength to decrease the first transmission characteristic values and thereby temporarily lower the second transmission characteristic values to a given target value, restoring the amount of pre-emphasis or the transmission factor to original values thereof to restore the first transmission characteristic values to initial values thereof, determining widths of variations of the first transmission characteristic values at that time, determining an average of the widths of variations of the first transmission characteristic values over all wavelengths, adjusting the transmission factor for each wavelength to vary the first transmission characteristic values by

an amount corresponding to the optimum allocation, and adjusting the amount of pre-emphasis for each wavelength to further vary the first transmission characteristic values by an amount corresponding to the optimum allocation.

28. (previously presented) The method according to claim 27, wherein, assuming a ratio representing the optimum allocation between a controlled variable of the transmission factor versus wavelength characteristic and the controlled variable of the amounts of pre-emphasis to be X to 1 - X, a variation in the first transmission characteristic values by control of the wavelength characteristic according to the optimum allocation is a product of a difference and X, and the variation in the first transmission characteristic values by control of the amounts of pre-emphasis according to the optimum allocation is a product of the difference and 1 - X.

29. (previously presented) The method according to claim 27, wherein the given target value is a minimum value of the second transmission characteristic values specified by the communication system.

30. (currently amended) The method according to claim 2219, wherein the first transmission characteristic values are optical signal to noise ratios (OSNR), and the second transmission characteristic values are Q factors.

31. (currently amended) The method according to claim 2219, wherein the first transmission characteristic values are optical signal to noise ratios (OSNR), and the second transmission characteristic values are bit error rates (BER).

32. (previously presented) The method according to claim 19, wherein the measurements in the measuring of transmission characteristics of optical signals operation are made by the receiving station.

33. (previously presented) The method according to claim 19, wherein control in the controlling based on the measurements of the transmission characteristics operation of the amounts of pre-emphasis in the transmitting station and the transmission factor versus wavelength characteristic of the optical tunable filter is performed by the receiving station.

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34.    (previously presented)  The method according to claim 19, wherein control in the controlling based on the measurements of the transmission characteristics operation of the amounts of pre-emphasis in the transmitting station and the transmission factor versus wavelength characteristic of the optical tunable filter is performed by the transmitting station.

35-37.  (cancelled)

38.    (currently amended)  A transmission characteristic equalizing system, comprising:

an optical tunable filter having a variable transmission factor versus wavelength characteristic and placed along an optical transmission path between a transmitting station and a receiving station in a wavelength division multiplexing optical communication system;

a transmission characteristic measurement unit to measure transmission characteristics of optical signals of different wavelengths transmitted over the optical transmission path; and

a transmission characteristic control unit to match the transmission characteristics for the optical signals according to measurements from the transmission characteristic measurement unit, the transmission characteristic control unit calculating an optimum allocation between a controlled variable of amounts of pre-emphasis in the transmitting station and a controlled amount of a transmission factor versus wavelength characteristic of the optical tunable filter and controlling the amounts of pre-emphasis and the transmission factor versus wavelength characteristic according to the optimum allocation,

wherein the transmission characteristic measurement unit measures first and second transmission characteristic values having a correlation with each other as the transmission characteristics, and the transmission characteristic control unit first controls only the transmission factor versus wavelength characteristic of the optical tunable filter to equalize the first transmission characteristic values and then temporarily equalize the second transmission characteristic values with reference to the equalized first transmission characteristic values, then calculates the optimum allocation with reference to the transmission factor versus wavelength characteristic of the optical tunable filter at a time of temporary equalization of the second transmission characteristic values, and controls the transmission factor versus wavelength characteristic of the optical tunable filter and the amounts of pre-emphasis in the transmitting station according to the optimum allocation to thereby equalize the second transmission characteristic values.

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39.     (currently amended)  A method of equalizing transmission characteristics for optical signals, comprising:

placing an optical tunable filter having a variable transmission factor versus wavelength characteristic along an optical transmission path between a transmitting station and a receiving station in a wavelength division multiplexing optical communication system;

measuring transmission characteristics of optical signals of different wavelengths transmitted over the optical transmission path; and

matching the transmission characteristics for the optical signals based on measurements of transmission characteristics, by calculating an optimum allocation between a controlled variable of amounts of pre-emphasis in the transmitting station and a controlled amount of a transmission factor versus wavelength characteristic of the optical tunable filter and by controlling the amounts of pre-emphasis and the transmission factor versus wavelength characteristic according to the optimum allocation,

wherein, in the measuring of transmission characteristics of optical signals operation, first and second transmission characteristic values having a correlation with each other are measured as the transmission characteristics, and, in the controlling based on the measurements of the transmission characteristics operation, only the transmission factor versus wavelength characteristic of the optical tunable filter is controlled to equalize the first transmission characteristic values and then temporarily equalize the second transmission characteristic values with reference to the equalized first transmission characteristic values, then the optimum allocation is calculated with reference to the transmission factor versus wavelength characteristic of the optical tunable filter at a time of temporary equalization of the second transmission characteristic values, and the transmission factor versus wavelength characteristic of the optical tunable filter and the amounts of pre-emphasis in the transmitting station are controlled according to the optimum allocation to thereby equalize the second transmission characteristic values.